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UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service

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APPRECIATION SHOWN

Very heavy rains this past winter tested the effectiveness of the erosion control work completed by the Service.

At Aliso Creek Project one of the cooperators sent the following to our project manager:

April 1, 1937

Mr. C. W. Wilson
Project Manager
Soil Conservation Service
City Hall, Santa Ana, Calif.

Dear Mr. Wilson:

At a recent meeting of the Owners of the Los Alisos Ranch, when the work of the S.C.S. was discussed, I was asked to write this letter.

All of us appreciate and realize that the value of our property, consisting of 126 acres, highly developed with Valencia Oranges, representing an investment of $300,000, has been substantially increased by the program of your department.

We wish to mention some of the benefits accomplished:

(1) The cement lined drainage ditches constructed to take the run-off from the contours.
(2) The system of concrete collars and pipe and wire revetments stabilizing the gullies through the center of the orchard.
(3) The terrace system and dyke on the Trickey lease, Whiting property, eliminated much damage from silt being deposited around the trees, that has always accrued from previous rains.
(4) The main gully along the east line of our ranch, which the S.C.S. straightened and enlarged, proved to be of great benefit. In fact, our investment in material and use of equipment of $1,000 undoubtedly saved damage in loss of soil and trees, during the first season, amounting to several thousand dollars.

It is our observation that the S.C.S. plan on our property has proven to be 100% satisfactory.

We still consider that there is need for additional up-stream engineering to prevent silt washing on us, and to hold and conserve the rainfall, so as to eventually raise the water table, and prevent water, which is worth at least $15 per acre foot, wasting to the ocean.

We will be very glad to cooperate in any plan designed for water conservation.

Yours truly,

(sgd) LOS ALISOS RANCH
by: E. T. McFadden
Managing Partner

SELECTING SITES FOR LEVEL BASIN TERRACES

- by -
Howard M. Gabbert, Regional Technician
Section of Conservation Surveys

Level basin terraces comprise a series of large bathtub-like catchment basins, each of which is approximately 15 feet long, 7 feet wide and 2 feet deep. Their primary function is to collect and hold the rainfall allowing it to penetrate into the soil and underlying substratum, thus preventing erosion and water loss. This type of control is generally applicable to highly erodible slopes, which have been or are to be removed from cultivation. Specifically however, the selection of suitable locations for basin terraces involves consideration of complexly related economic and physical circumstances. Where the latter conditions, involving soils, geology, and location with respect to more valuable agricultural land, are unusually favorable, economic justification is often an automatic consequence.

Questions to Consider

Some of the more important questions to consider before making field investigations are: (1) What is the existing degree of erosion? (2) Is the soil sufficiently permeable to permit penetration? (3) Is the bedrock permeable or is it subject to slipping? (4) Will the ground water supply be benefitted, particularly if there are adjacent springs for livestock watering or other practical uses?

Consideration of these items will result in directed observation and comprise a check on the accuracy of the recommendations. If the answers are favorable, there is no reason why level basin terraces cannot be effectively used; if field conditions do not satisfy the questions, basin terraces can immediately be eliminated as a possible control practice.

Selection of Sites

It is apparent that the actual selection of sites for basin terraces necessarily involves a correct interpretation of field conditions. The following discussions of significant physical factors are based on observations made following intense rains and suggest "where" and "how" the answers to the foregoing questions may be found in the field.

Degree of Erosion

The existing degree of erosion, indicating what has occurred during the past under known amounts of rainfall, provides an index of what to expect in the future.

If a slope is highly eroded it is obvious that there is serious water as well as soil loss, and if other circumstances are favorable basin terraces would be desirable. If erosion is negligible due to a favorable soil structure and vegetative cover, the apparent indication is that artificial methods are unnecessary to promote further water and soil conservation.

Soils

Successful basin terraces depend on rapid water penetration. If the soil is impervious the basins will fill and overflow, causing greater erosion damage than would normally occur without any control. Permeable soil is the first necessary prerequisite. Many soils are characterized by a compact clay layer which varies in thickness. If the underlying parent material is permeable however, it is often possible to cut through this layer and achieve desirable results.

The lower "C" horizon or geological parent material also requires careful analysis. The soil itself may be permeable and overlie a highly impervious bedrock or a series of interbedded sandstones and clay shales. The latter situation requires particularly careful checking as the site would appear otherwise suitable from surface and soil conditions. The results of putting in basins under such circumstances however, would not be satisfactory. The areas underlain by shale would tend to slip and the entire system would be adversely affected.

Geologic Structure

Geologic structure involves the angle at which the strata or beds dip from the horizontal. It comprises the subsurface "framework" and may include complex folds or relatively simple dips in one direction. These dips control the direction and ultimate destination of water after it has percolated through the soil. Water movement is often facilitated by a highly permeable sandstone bed sandwiched between two impervious layers. The sandstone may be exposed over an entire hill and outcrop a half-mile down the valley, giving rise to a spring at that point. A simple illustration of this would be to

place a long flat sponge between two boards, tilt them at an angle and pour water in at the upper end. As soon as the sponge is saturated water will flow out at the lower end.

Benefits of Level Terraces

Similar field circumstances actually exist on one of the southern California projects where the springs are vitally important as a source of water for livestock. There are certain definite sites where basin terraces can be put in and not only benefit the springs but control serious erosion and deposition of infertile sand on the lower valley land.

It is just as essential to recognize all of the physical factors discussed in selecting locations for basin terraces as it is to put the right shoe on the right foot. The only difference being that in soil conservation work the control measure must be fitted to a given set of site circumstances to achieve efficient results.

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Erosion in California

It is estimated by soil conservationists that erosion has caused the abandonment of 159,000 acres of farm land in California, and is jeopardizing 13,000,000 acres out of the state's 30,000,000 acres of agricultural land. They estimate that over 2,000,000 acres are severely eroded, with much of the surface soil gone, and over 11,000,000 acres are suffering from moderate erosion.

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The Virgin Valley Voluntary Soil Conservation Association executive committee members have expressed their complete satisfaction with the conservation work accomplished by the Service in the Bunkerville, Nevada, area.

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PLANTINGS CONTROL GULLIES

By Chas. W. Cleary, Jr.,
Assistant Regional Agronomist

Gullies can be controlled by farmers themselves where water from small drainage areas must be cared for and where the slopes are moderate.

Excellent results have been obtained on Soil Conservation projects through the use of plants that are adapted to the purpose.

Plants most widely used this season are Water Moty Baccharis sp., Willow Salix sp., Napier Grass Pennisetum purpureum, Australian Saltbush Atriplex semibaccata, Western Rye Grass Lolium multiflorum and Lippia Lippia repens.

Vegetative Dams

The first three, the larger and heavier plants, are most valuable in gullies where they may be used as revetment material and as vegetative dams. They are also useful in plugging up and forming head controls for the fingers which eat back from the gullies.

Water Moty and Willow

Water Moty and Willow have been used to good effect in vegetative check dams. These dams are formed by excavating a trench a foot wide and a foot and a half deep and well back into the sides of the gully. Water Moty or Willow poles, three feet long and one to two inches in diameter, are cut and placed upright a foot apart on either side of the trench. The trench is filled with alternate layers of brush, rocks, and dirt well tamped in. As the alternate layers are built up,brush should be laced through the poles. A foot high in the center is usually sufficient for this type of check dam. Care must be used to make the center of the dam considerably lower than the sides to avoid washing out around the ends. A more solid structure may be obtained by lacing the tops of the poles together with baling wire.

Checks Easily Repaired

A man can build two or three of these in a day in a gully eight or ten feet wide, if excavation is not difficult and brush is readily available. Some of these checks may wash out the first winter but they are easily repaired and once the live poles have

started a good root system they are permanent. As the materials in the checks grow it will be necessary to cut it back in the center and keep a sufficient water way open..

Head Erosion

The same plant material may be used to construct head controls where head erosion is a problem in a gully. By using the same type of construction on a larger scale with large heavy poles at the gully head and bringing the water down to the bottom of the channel in a series of steps formed by these dams, further headward erosion may be checked.

Water Moty, Willow and Napier Grass, (a tall hardy perennial grass) have been used in gully control simply as cuttings. The banks of the channel are lined with cuttings and at intervals cuttings are set in the channel bottom in the form of a V with the point down stream.

Maintenance Work

Vegetative material grows, and it is often possible to build up a gully bottom that has become undesirably deep. It must be borne in mind, however, that in all vegetative channel control it is necessary to do sufficient maintenance work each year to keep an adequate waterway open.

Australian Saltbush

Australian Saltbush, a low growing hardy shrub, which forms a dense mat ideal for erosion protection, is much in demand for gully control. The plant is especially valuable because of its tolerance of unfavorable soil and limited moisture conditions. It is rather slow in starting and when planted on gully or ditch banks often makes a rather unimpressive showing the first year. The second growing season, however, will nearly always produce good results. Saltbush is not adapted to acid soils.

Planting of Saltbush

Best results have been obtained with Saltbush by planting it in rows. A trench made with a V hoe serves very well as a seed bed. Saltbush and Oats planted in alternate rows six to eight inches apart make an excellent combination. The oats provide protection from erosion during the first year while the Saltbush is getting started and if the seed is planted in alternate rows six or eight inches apart the Oats do not compete seriously with the slower starting perennial.

Seeded or Sodded Waterways

Small, seeded or sodded, waterways are being used this year as outlets for annual ditches in orchards. These are especially applicable in orchards which are irrigated during the summer. By liberal use of fertilizer, carefully prepared seed bed, and adequate irrigation through the first summer, it is possible to secure a very heavy sod that will carry a considerable volume of water on a rather steep grade. These waterways should be planted in the spring after the heavy rains are over to avoid washing while the sod is becoming established.

Common Sod-Forming Grasses

Any of the common sod forming grasses will give good results, since it is possible to provide good growing conditions. Once established, the sod will be maintained through the summer by run-off irrigation water. Rye grass has been used effectively.

Lippia sod may be started in a waterway by cutting strips of sod and laying them across the ditch in the form of vegetative collars. If conditions for growth are favorable, the sod will spread and vegetate the entire ditch bottom in a few years.

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CCC Anniversary

Along with other Civilian Conservation Corps Camps throughout the nation, the eleven CCC Camps assigned to the Soil Conservation Service in California and Nevada celebrated the fourth anniversary of the founding of the organization. The CCC was officially founded April 5, 1933.

"Open House" was held by the camps so that people in the surrounding country and communities could have the opportunity to become better acquainted with camp personnel and soil erosion control activities.

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CUCAMONGA CCC CAMP TO BE OCCUPIED

Establishment of a new erosion control demonstration area in San Bernardino County in Southern California has been announced. The CCC Camp at Cucamonga will be occupied May 1 by enrollees now engaged in soil conservation work near Palos Verdes.

Location

The new area in the western end of San Bernardino County surrounds the cities of Upland and Cucamonga and the area east of Ontario and southwest of Fontana. It is the northwestern portion of the San Bernardino Valley east of the Los Angeles County Line.

It was selected with the cooperation of the California Soil Conservation Advisory Committee and the State Extension Service and Experiment Station.

Land Conditions

Land conditions are representative of many of the subtropical fruit growing districts of Southern California. Elevation at the northern boundary is 2500 feet, sloping gradually at the rate of about 300 feet per mile to the southern boundary, which has an elevation of 800 feet.

Erosion

Valuable groves of citrus, walnuts, and peaches and farm lands have suffered,through erosion, the loss of large amounts of highly fertilized surface soils at the times of heavy rainfalls. In addition the sandy area northeast of Ontario has suffered from wind erosion.

Conservation Measures

In cooperation with farmers in the area, the Service will demonstrate soil-saving methods on representative individual farms. The methods will include the addition of organic material to the soil, the growing of cover crops, the use of annual ditches across the slopes, conservation of winter rainfall and the control of excess run-off of water. In addition, a control program may be developed in the wind eroded areas.

Where new plantings are made,the advantage of planting on the contour will be demonstrated. Other erosion control devices, such as check dams, will be built where needed.

Program

Work will be carried on in cooperation with the farmers and interested state and local agencies. To establish the demonstration, the Service agrees to provide necessary technical planning and assistance in setting up erosion control programs for individual farms. In return the farmer agrees to follow the recommended practices for a five year period. The individual farmers supply as much of the labor and materials as possible and the Service furnishes supplementary labor and equipment necessary to do a complete job.

The West End Voluntary Soil Conservation Association, of more than 300 members, of which John Klusman is President, is taking an active part in cooperating with the Service.

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TERRACES IN PALOS VERDES AREA PROTECT FIELDS AND ROAD

Mud, tons of it, used to sweep off clean-cultivated fields onto the Palos Verdes Coast Road, frequently making sections of it, in the vicinity of the lighthouse, impassable. Not only did the farmers lose topsoil, with its wealth of plant nutrients, but the road department of the County of Los Angeles was put to considerable expense in removing debris.

Road Free of Mud

This year, despite a season with twenty inches of rainfall, the road was free of mud. Broad-base terraces constructed by the Palos Verdes CCC Camp have practically eliminated soil washing on the fields. Run-off water, instead of dashing down the slopes, was carried along terrace channels to lined-ditches. In addition, more water penetrated into the soil due to the slowing up of the velocity.

Work Accomplished

Palos Verdes Camp has constructed 45 miles of terraces in this area since October 21, 1935. Other conservation work included the building of 209 small masonry or concrete dams to stabilize gullies, the planting of 349 acres of highly erodible land to trees, the building of 36,000 linear feet of diversion ditches, and 47,000 linear feet of hillside grade ditches, and rodent control operations covering over 10,000 acres. Enrollees from this camp will occupy The Cucamonga CCC Camp on May 1.